

REMARKS

Claims 1 and 6-8 are rejected under 35 U.S.C. §102(b) as anticipated by the patent to Cramer et al. (US 5,061,015 and hereinafter also referred to as Cramer). Claims 2-5 and 9-15 are rejected under 35 U.S.C. §103(a) as being unpatentable over the Cramer patent in view of the patent to Hayden (US 4,095,213). Independent Claims 1 and 9 have been amended, as well as dependent Claim 11. Claims 10 and 12 have been canceled. New Claims 16-20 have been added. Reconsideration of the rejection of Claims 1-9, 11 and 13-15 and consideration of new Claims 16-20 are respectfully requested.

The present invention is directed to embodiments for controlling a park brake system using electrical hardware. A number of operation modes are made available to the vehicle operator. In one embodiment, electrical hardware utilized to apply a park brake is implemented in a straightforward manner independently of any processor control. This can be accomplished by a direct connection between a pressure switch subassembly and an electric switch assembly. In at least one embodiment, the electric switch assembly can be manually controlled by the vehicle operator in order to override the application of at least one park brake thereby releasing the park brake and allowing the vehicle operator to control vehicle movement.

Although the prior art has some similarities when compared with the present invention, the particular electric hardware and/or modes of operation are not disclosed in the prior art, particularly the Cramer and Vandemotter (US 4,763,959) patents. The Cramer patent discloses an electropneumatic subsystem in a vehicle for use in controlling tractor park brakes, tractor service brakes, trailer park brakes and trailer service brakes. This invention addresses the problem of trailer breakaway and devises a solution by ostensibly reducing the complicated pneumatic plumbing in the underdash of the vehicle. This is accomplished using controlled valves 40, 80 and solenoid valves 50, 74. The valves 40, 80 communicate with tractor and trailer brakes. The solenoid valves 50, 74 are controlled by an electronic control unit 62. Among other inputs, the electronic control unit 62 receives an input from a pressure sensor 56. The pressure sensor 56 is used in protecting the tractor braking system during trailer breakaway. In particular, the tractor braking system is maintained when there is a pressure loss detected by the pressure sensor 56, which communicates with the trailer parking brakes. This loss of pressure is input to the electronic control unit 62. Based on this input, the electronic control unit 62 deactuates the solenoid valve 54. This closes off

upstream portion 52 and vents downstream portion 48, which is connected to the trailer parking brakes. Additionally, the pilot pressure port 46 of the valve 40 has less pressure communicated to it so that the valve 40 switches to vent downstream portion 44 and shutoff upstream portion 42. Based on these changed configurations, the operator is still able to rely on the tractor parking and service brakes, even though the trailer brakes are non-functional. Available modes of operation involving the tractor and trailer are described beginning at column 3, line 24 and continuing to column 4, line 15.

The Vandemotter patent also discloses electropneumatic control for a vehicle brake system. Importantly, the electric hardware includes an electronic control module 26 that has a microprocessor. Among other functions and as described in column 4, beginning at line 37, the microprocessor monitors a number of pressure sensors. If a low pressure condition is detected, the microprocessor controls the trailer brakes so that they are automatically applied in the case of such a malfunction.

The patent to Hayden relates generally to an electrical control relay that can be used with a vehicle. The relay includes a load 28 that can be manually pushed inwardly to activate an air conditioner. Once pushed inwardly, it remains in that position until the vehicle ignition is turned off or by pulling it outwardly. No mention is made in this patent of an electric switch that is manually controlled to release a park brake.

With reference first to amended Claim 1, relevant comparisons are made between the claim language and the prior art, which establish the patentable merit of Applicant's invention. Claim 1 calls for an electric switch assembly and a pressure switch subassembly that communicates with it. The pressure switch subassembly is in a first state when at least a threshold pressure is detected and a second state when less than the threshold pressure is detected. Significantly, the pressure switch subassembly directly controls independently of any processor control the electric switch assembly. This control that is directly provided by the pressure switch subassembly is present when it changes from the first state to the second state whereby the at least one park brake is applied. In accordance with this key claim language, Applicant's electronic control is exercised in straightforward fashion and involves a reduced number of control parts. Such control has specific utility in causing the at least one park brake to be applied.

In contrast, the Cramer electropneumatic subsystem incorporates and necessarily relies on an electronic control unit 62 in connection with controlling operation of the various valves. The electronic control unit 62 also receives input from the pressure sensors, including the pressure sensor 56. The intelligence of the electronic control unit makes determinations in connection with controlling the states of the solenoid valves and concomitantly the valves 40, 80. Furthermore, no mention is made in the Cramer patent of controlling the application of at least one park brake by a pressure switch changing from a first state to a second state when a pressure is detected that is less than a threshold pressure. Instead, the Cramer patent is directed to solving problems related to utilizing the same components for brake control purposes that can also be properly relied on when there is trailer breakaway.

The Examiner also relies on the Vandemotter patent. However, like the Cramer patent, control for this prior art invention also resides in an electronic control module that includes a microprocessor, which is programmed to provide certain functions depending upon the states of inputs. When a pressure sensor indicates a low pressure condition, this information is processed by the microprocessor, particularly an executable software program. After processing, appropriate action can be taken. There is no description and the drawings do not, and would not, show direct control between a pressure sensor and an electric switch since there is no direct communication between such components in the Vandemotter patent. Instead, control resides in a microprocessor, which is inapposite to the requirements of Claim 1.

If the rejection of Claim 1, as now amended, should be maintained, it is respectfully requested that it be pointed out with specificity how each and every element and its associated function, as well as arrangement with other elements, are disclosed in the Cramer and/or Vandemotter patents. Since no disclosure or teaching can be found within the Cramer and/or Vandemotter patents themselves related to direct control independently of any processor control between a pressure switch subassembly and an electric switch assembly, Claim 1 is not anticipated. Hence, Claim 1 should be allowed.

Claims 2-8 are dependent claims that depend, either directly or indirectly, from Claim 1. Each of these claims is patentable based on the reasoning set forth in the discussion of Claim 1. In addition, the dependent claims recite further structure that is limited to the park brake controlling apparatus of Claim 1. Regarding dependent Claims 2-5, the Examiner also relies on the Hayden

patent. The Hayden patent merely describes a control relay that can be used in a vehicle. It is inapplicable to the claimed inventions that are directed to vehicle park brakes and park brake systems. With respect to Claims 7 and 8, reliance is placed on brief background information in the Cramer patent. Applicant respectfully submits that there is no disclosure in the Cramer patent which anticipates the claim language of Claims 7 and 8. Thus, dependent Claims 2-8 should be allowed.

Claim 9 is an independent method claim that is directed to a method for utilizing a combination of an electric switch assembly and a pressure switch subassembly, particularly how they cooperate with each other in applying a park brake system and releasing the park brake system by manually controlling the electric switch assembly. The method of this invention defines operating modes of the park brake system and specifically includes the mode for overriding the park brake system. This feature is beneficial in allowing the operator to control movement of the vehicle when that is desirable, such as movements of short distances. This method of operation is not found in the prior art of record.

In particular, amended Claim 9 calls for an electric switch assembly and a pressure switch subassembly and communication therewith. The electric switch assembly is changed from a first position to a second position when at least a threshold pressure is detected. When detected, the at least one park brake system is released. However, the method also requires the step of applying the park brake system when the pressure switch subassembly detects a pressure less than the threshold pressure. Additionally, the electric switch assembly is manually controlled by movement from the second position to the first position after the pressure switch subassembly detects such pressure being less than the threshold pressure whereby the park brake system is released.

In contrast, the Cramer patent describes operations of various valves and push buttons 64, 66 whereby tractor and trailer brakes can be applied or released. On the other hand, there is no mention of any push button or switch that is manually controlled to release a park brake when a pressure switch subassembly detects pressure less than a threshold pressure. Generally, the Cramer patent fails to suggest any operation or step related to overriding the application of a park brake, particularly by manually controlling an electric switch assembly. This lack of disclosure also exists in the Vandemotter and Hayden patents. Again, Applicant's invention is configured to make available a number of modes of operation in order to provide the vehicle operator with greater flexibility in operating the vehicle.

If the rejection of Claim 9, as now amended, should be continued, it is respectfully requested that a *prima facie* showing be made as to how the prior art references can be combined including identification of specific disclosures in the references which meet the terms of Claim 9. Unless this can be done without relying on unwarranted hindsight and the disclosures in the present application, Claim 9 should also be allowed.

Claims 11 and 13-15 are dependent claims and are patentably distinct for the reasons urged in connection with Claim 9. These claims further limit the methodology of Claim 9 in ways that are not described in the prior art references. Therefore, Claims 11 and 13-15 should be allowed.

Claims 16-20 are dependent claims. Claims 16 and 17 depend from amended Claim 1. Claim 16 requires that the pressure switch subassembly have an output conductor that connects to the electric switch assembly. Claim 17 requires that the output conductor contact that electric switch assembly. In contradistinction, the Cramer and Vandemotter patents teach an electronic control unit or electronic control module that receives inputs and processes information for providing desired controls. Such electronic control acts to separate detected inputs from controlled outputs, unlike the claimed inventions. Claim 18 also depends from Claim 1 and further limits the apparatus to a manually controlled electric switch assembly that moves between positions in order to release a park brake system when the pressure switch subassembly detects pressure less than a threshold pressure. For the reasons pointed out in the discussion of Claim 9, the feature of Claim 18 patentably distinguishes the prior art references.

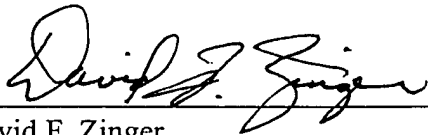
Claims 19 and 20 are dependent claims that depend from Claim 9. Claim 19 recites applying the at least one park brake system independently of any processor control. Claim 20 recites that the output conductor of the pressure switch subassembly is connected to the electric switch assembly. Based on the reasoning presented in the discussion of Claim 1, Claim 19 should be allowed. Likewise, the patentable subject matter of Claim 20 is also set out in new dependent Claim 16 and is allowable for the same reasons.

No fees are believed to be due in connection with the filing of this response, but in the event that fees are due, please debit Deposit Account No. 19-1970.

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A sincere effort has been made to place the application in condition for allowance. Early notice of such allowance is, therefore, earnestly solicited.

Respectfully submitted,

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Version With Markings to Show Changes Made

IN THE CLAIMS:

Claims 10 and 12 were canceled.

Claims 16-20 were added.

Claims 1, 9 and 11 were amended as follows:

1. (Amended) An apparatus for controlling at least one park brake in a vehicle, comprising:

an electric switch assembly;

a pressure switch subassembly communicating with said electric switch assembly, said pressure switch subassembly being associated with at least first and second states, said pressure switch subassembly being in said first state when at least a threshold pressure is detected and said pressure switch subassembly being in said second state when less than said threshold pressure is detected, wherein said pressure switch subassembly directly controls independently of any processor control said electric switch assembly, at least when a pressure less than said threshold pressure is detected and said pressure switch subassembly changes from said first state to said second state such that the at least one park brake is applied;

at least one park brake release actuator; and

a control assembly in communication with each of said electric switch assembly and said pressure switch subassembly that controls application of fluid to at least said at least one park brake release actuator.

9. (Amended) A method for controlling at least one park brake system in a vehicle, comprising:

providing an apparatus that includes an electric[al] switch assembly and a pressure switch subassembly in communication with said electric switch assembly for detecting whether a threshold pressure exists related to a fluid system of the vehicle; [and]

changing said electric switch assembly [between] from a first position to a second position [depending on] when at least said threshold pressure is detected to release the at least one park brake system;

applying the at least one park brake system when said pressure switch subassembly detects a pressure less than said threshold pressure; and

controlling manually said electric switch assembly by movement from said second position to said first position after said pressure switch subassembly detects said pressure less than said threshold pressure in order to release the at least one park brake system.

11. (Amended) A method, as claimed in Claim [10] 9, wherein:

said applying [step] includes causing said electric switch assembly to change to said second position and said apparatus includes a pilot solenoid valve subassembly that de-energizes when said electric switch assembly is in said second position, said pilot solenoid valve subassembly fluidly communicating with a relay valve subassembly and in which said relay valve subassembly is used to interrupt fluid delivery to the at least one park brake system.